Public Health Assessment

Lisle Residential Wells

Lisle, DuPage County, Illinois

EPA Facility ID: ILN000508135

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Prepared by

Illinois Department of Public Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Purpose

The Illinois Environmental Protection Agency (Illinois EPA) asked the Illinois Department of Public Health (IDPH) to evaluate the data from their investigation of the residential wells south of the Lockformer Company property in Lisle, DuPage County, Illinois, to determine whether current conditions pose a public health hazard.

Background and Statement of Issues

The Lockformer Company property is at 711 Ogden Avenue in Lisle, Illinois. The property is about 1,500 feet west of Interstate 355 and is approximately 12 acres in size. Residences are north of the property across Ogden Avenue; southeast of Lockformer along Chicago and Elm Avenues; about 2,500 feet south of Lockformer across the Metra rail line and St. Joseph Creek; and about 1,500 feet west of Lockformer south of Ogden Avenue (Attachment 1).

Lockformer Company is a metal fabricating facility. Releases of trichloroethylene (TCE) had allegedly occurred on the Lockformer property from 1968 to an undetermined time. The company reportedly used TCE as a degreaser to clean metal parts. The contamination at Lockformer is under investigation by the U.S. Environmental Protection Agency (USEPA) and Illinois EPA.

In the summer of 2000, a group of residents hired legal counsel and had their wells tested by a private environmental consultant on October 11, 2000. The residents owned homes downgradient of Lockformer in the suspected path of groundwater flow. The consultant collected a second round of well samples on November 10, 2000. TCE was detected in some of the wells sampled. Illinois EPA collected about 350 more private well samples north and south of Lockformer. IDPH sent letters to residents giving a health interpretation of their laboratory results and explaining ways to reduce exposure to chemicals in their well water.

TCE was not detected in samples collected from private wells north of Ogden Avenue. About 175 private wells south of Lockformer contain TCE. Low levels of tetrachloroethylene (PCE), 1,1,1-trichloroethane (TCA), and methyl tert-butyl ether (MTBE) have also been detected in a few wells, detected at elevated levels south of Lockformer. The highest level of TCE was 19.5 micrograms per liter of water (µg/L). Traces of TCE have been detected as far away as Southcrest Drive, about 2.5 miles south-southeast (Attachment 2).

IDPH staff first visited the area on October 28, 2000, and most recently on October 17, 2001. The Lockformer parking lot was easily accessible from Ogden Avenue. From the parking lot, we observed monitoring wells on the southern portion of the property. The land south of Lockformer slopes downward to the Metra rail line and St. Joseph Creek (Attachment 1). The wells closest to Lockformer on the south are along Elm Avenue north of St. Joseph Creek, but TCE has not been found in those wells. South of the creek, contamination has been found in wells along Front

Street, Riedy Road, Hitchcock Avenue, and Gamble Avenue. Residents along these streets now have access to public water.

The Illinois Attorney General filed suit against Lockformer on January 19, 2001. A subsequent preliminary injunction called for Lockformer to provide bottled water to affected homes, conduct an environmental investigation (EI) with Illinois EPA oversight, and devise a remedial action plan to resolve problems found in the EI. Lockformer has been providing bottled water to affected homes since that time.

Staff from IDPH, Illinois EPA, and the Illinois Attorney General's Office attended the Village of Lisle Trustees meeting on February 5, 2001. The Attorney General assured the mayor, trustees, and citizens in attendance that the state would work with Lockformer, the village, and area residents to resolve the issue.

On October 31, 2001, USEPA issued a Unilateral Administrative Order to Lockformer to submit a Removal Action Work Plan (RAWP) for their approval. The RAWP provides for the immediate removal of the source material (TCE) or hot spots with the goal of mitigating the continuing release of TCE from the affected soils at the Lockformer facility to the groundwater.

Discussion

Chemicals of Interest

IDPH compared the results of each groundwater sample collected with the appropriate comparison values to select chemicals for further evaluation for exposure and possible carcinogenic and non-carcinogenic health effects. Chemicals found at levels greater than comparison values or those for which no comparison values exist were selected for further evaluation. A discussion of each comparison value used is found in Attachment 3. IDPH assumed that the samples were collected and handled properly and that appropriate analytical techniques were used. The one chemical that exceeded comparison values is TCE, which is the chemical of interest.

Exposure Evaluation

Residents who use private well water and have TCE in their water are exposed by drinking the water, inhaling TCE during household water use such as showering or bathing, and by skin contact with the water. The potential for exposed persons to experience adverse health effects depends on –

- the specific chemicals to which a person is exposed,
- how much of each chemical a person contacts,
- how long a person is exposed, and
- the health condition of the person exposed.

IDPH used exposure scenarios based on adults drinking two liters of water per day and children drinking one liter of water per day. We also assumed that residents would be exposed during bathing and showering.

TCE

The highest level of TCE detected in a private well near the Lockformer property was 19.5 µg/L. The maximum contaminant level (MCL) for TCE is 5 µg/L. MCLs have been established by the U.S. Environmental Protection Agency for public water supplies to reduce the chances of adverse health effects from drinking contaminated drinking water. The standards are well below levels for which health effects have been observed and are enforceable limits that public water supplies must meet.

IDPH estimated the dose of TCE for children and adults through ingesting groundwater containing 19.5 µg/L and found that exposure to that level of TCE would pose a very low increased cancer risk.

The estimated exposure to children and adults is less than the no-observed-adverse-effect levels (NOAELs) for TCE in animals. NOAELs reflect doses used in animal studies that did not result in observable health effects.

Studies of humans exposed to low levels of TCE in drinking water suggest that adverse health effects may include skin rashes, liver problems, urinary disorders, anemia and other blood disorders, and diabetes, but levels that might cause those effects are not well established. None of those symptoms were reported at the level found in the drinking water well.

In the mid 1990s, USEPA withdrew the reference dose and cancer potency factor for TCE for review. To evaluate the potential health hazards of exposure to TCE in Lisle, IDPH used information from human and animal studies, the former cancer potency factor, and the current MCL for TCE. In August 2001, USEPA released a draft toxicological reassessment of TCE for comment. Although data proposed in this reassessment are not yet USEPA policy, if adopted the proposed cancer potency factor would be greater than before. Using the proposed cancer potency factor, we estimate that persons exposed to TCE at levels greater than the current MCL could experience a low increased risk for liver and kidney cancer. If USEPA adopts the proposed cancer potency factor, they may also reevaluate the MCL for TCE.

Tests for levels of TCE present on the site have not been completed. For that reason, we cannot evaluate whether levels of TCE migrating toward private wells could increase with time.

Community Health Concerns and Activism

Area residents have expressed concern that Lockformer Company knew about the spilled TCE since at least 1992 and did not notify persons with private wells until this year. Residents are

concerned that they may have been drinking contaminated water for more than a decade. Some residents have filed suit in federal court against Lockformer, citing health concerns and diminished property values in the complaint.

Citizens present at the February 5, 2001, village trustees meeting expressed concern about the high cost of connecting to the public water system. Depending on the home, the cost could be up to $20,000.

On October 16 and 17, 2001, IDPH participated in public availability sessions in Lisle and Woodridge to answer health-related questions about the Lisle groundwater contamination. IDPH staff answered questions about the health effects of exposure to low levels of TCE and shared ways to reduce exposure. About 150 persons attended these availability sessions.

Health Outcome Data

The IDPH Division of Epidemiologic Studies reviewed the incidence of cancer for zip code 60532 from 1989 to 1997 in Lisle, Illinois, and found that the rate of kidney cancer in males was statistically significantly greater than the expected number of cases (20 cases observed and 10 cases expected). In females, the rate of kidney cancer was not elevated. IDPH plotted the cancer cases on a map. The cases did not seem to cluster in any neighborhood but rather followed the distribution of the population within the entire zip code study area. No clustering was noted near the contaminated wells. No other biologically plausible types of cancer related to TCE exposure was statistically significant.

Child Health Initiative

IDPH recognizes that children are especially sensitive to some contaminants. Children get a larger dose from drinking contaminated water because they drink more water per kilogram of body weight than do adults. IDPH includes children when evaluating exposures to contaminants and considers children the most sensitive population evaluated in this public health assessment. The doses that children experienced by drinking contaminated well water were not at levels known to cause noncarcinogic health effects. Carcinogenic effects are unlikely to occur.

Conclusions

Based on the information currently available, IDPH concludes the site poses a public health hazard because the potential for health effects resulting from long-term exposure to TCE is not well defined and because long-term use of the contaminated well water poses a very slight increased cancer risk. No studies were found that definitively associated an adverse health effect in animals or humans exposed to the levels of TCE found in the drinking water, but human studies found were limited. Additionally, data are not yet available to help evaluate whether levels of TCE in private well water could increase over time. The MCL of 5 μg/L for TCE in

drinking water is protective of public health; therefore, prudent public health practice supports the decision to provide alternative water to affected residents.

Although a review of cancer incidence data indicates that kidney cancer has occurred more in males residing within the zip code area than would be expected, the cases of kidney cancer are distributed throughout the zip code area and are not clustered near the site.

Recommendations and Public Health Action Plan

IDPH recommends that:

- USEPA and Illinois EPA seek a remedy to prevent future exposure to contaminated groundwater. Municipal water or a water treatment unit designed to remove VOCs that meets the National Sanitation Foundation standard number 53 are alternatives for persons with contaminated wells. USEPA, Illinois EPA and the Illinois Attorney General are negotiating with Lockformer to seek a resolution. USEPA and Illinois EPA continue field activities including data gathering and evaluation of alternative technologies for the immediate removal plan.

- Illinois EPA sample other potentially affected private wells to find the extent of contamination and ensure that exposures do not present a health hazard. Illinois EPA has completed sampling and has found the extent of the contamination in Lisle. Illinois EPA has found that the southern boundary of the detectable TCE contamination in private wells is near Southcrest Drive. As Illinois EPA sampled eastward into Downers Grove they found another area of contamination that they believe is unrelated to the Lisle groundwater contamination. Illinois EPA is sampling this area under a separate investigation and IDPH will conduct a separate health assessment for this area.

- Citizens be provided with information about ways to reduce or prevent exposure to contaminated groundwater. IDPH has met this recommendation through information sent in letters to area private well owners and provided to participants at the October 2001 public availability sessions.

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References

1. Agency for Toxic Substances and Disease Registry, ATSDR Update Toxicological Profile for Trichloroethylene, September 1997.

2. IDPH Division of Epidemiologic Studies, Incidence of Cancer in ZIP Code 60532 of Lisle, Illinois, 1989-1997, November 22, 2000.

3. Illinois EPA Files for Lockformer, Co.

Attachment 1

Lisle Residential Wells

MAP

Attachment 2

MAP

Attachment 3

Comparison Values Used in Screening Contaminants for Further Evaluation

Maximum Contaminant Levels (MCLs) have been established by USEPA for public water supplies to reduce the chances of adverse health effects occurring from exoposure to contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. These are enforceable limits that public water supplies must meet.

Lifetime Health Advisories for drinking water (LTHAs) have been established by USEPA for drinking water and are the concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects over a lifetime of exposure. These are conservative values that incorporate a margin of safety.